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PRODUCTIVITY OF DRY SEEDED AND TRANSPLANTED RICE (*Oryza sativa)* IN AMAN SEASON

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Direct dry seeding using power tiller operated seeder (PTOS) is an alternative option to the existing manual transplanting as it offers advantages, such as faster and easier planting and reduced labour. Furthermore, dry seeded rice matures earlier which saves some supplemental irrigation of Aman rice in most of the years. The rice seed can be grown continuously in row with the PTOS sometimes with uneven seed dropping which affects the uniform germination. To maximize the uniform and optimum plant stand, the International Maize and Wheat Improvement Center (CIMMYT) of Bangladesh has modified the PTOS which can sow seeds in drops maintaining varying number of seeds per drop at a certain distance (13-17 cm) rather than continuous seeding. The seeder is named as Versatile Multi-crop Planter (VMP). The options of different number of seed droppings at certain distance that is different seed rates may affect the productivity of rice. Therefore, the study was conducted to compare the direct dry seeded rice using the options of number of seeds per dropping of VMP with the existing transplanting method.

The experiment was conducted at the Bangladesh Rice Research Institute (BRRI) farm in Gazipur during T. Aman season in 2010. Dry seeded rice with two options of seeding 3-6 seeds per drop and 7-9 seeds per drop using VMP was compared with conventional transplanted rice. The treatments were assigned in a randomized complete block design with four replications. The unit plot size was 50 m^2. The seeds of rice variety, BR22 were soaked in water for 2 hours and unfilled grains that floated on the top of the water were separated from the seeds. Seeds were dried in air and were sown as per treatment in single pass tillage on 1 September at 20 cm row maintaining the drop at 13-17 cm apart. Seeds were soaked on the same day for seeding on the seedbed for transplanting. The seedling was transplanted on 1 October at 20 cm × 15 cm spacing with 3-4 seedlings per hill. The plots were fertilized at the rate of 80 kg N, 12.5 kg P, 42 kg K, and 10 kg S in the form of urea, TSP, MoP, and gypsum, respectively. The total amounts of P, K, and S were applied basally immediately before seeding or transplanting. Nitrogen was applied in three equal splits at 15, 30, and 45 days

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after seeding in DSR, while 0, 15 and 25, days after transplanting in transplanted crop. Non-selective herbicide glyphosate was applied 48 hours before the dry seeding and at land preparation for transplanting to control the weeds at the rate of 1.0 kg a.i. per ha. After seeding in DSR and transplanting in conventional practice, weeds were managed by manual weeding. Supplemental irrigation was done as and when necessary. The dry seeded rice was harvested at maturity on 1 January, while transplanted rice was harvested 11 January in 2011. The statistical analysis was done using CropStat Version 7.2. Economic analysis was performed to determine the productivity of different treatments.

Dry seeded Aman rice under two seed dropping and transplanting method significantly affected the yield components of rice except 1000-grain weight. The highest number of panicles/m^2 was found in transplanting method (355), which was comparable to dry seeding at 7-9 seeds per dropping (273) but significantly higher than 3-6 seeds per drop (243). In an experiment with DSR, Manjunatha *et al.* (2009) found more panicles/m^2 than transplanting. The highest filled grains per panicle was recorded in DSR at 7-9 seeds per dropping (74.0), which was similar to dry seeded rice at 3-6 seeds per drop (68.0) but significantly higher than transplanting method (53.3).

Table 1. Grain and straw yield, yield components, and field and growth duration of dry seeded Aman rice under two seed droppings and transplanting method, Aman 2010.

Establishment method	Panicles/ m^2 (no.)	Filled grains/ panicle (no.)	1000-grain wt (g)	Grain yield (t/ha)	Straw yield (t/ha)	Field duration (days)	Growth duration (days)
DS rice at 3-6 seeds/drop	243 b	68.0 ab	20.9	2.2 b	2.7 b	122 b	122 b
DS at 7-9 seeds/drop	273 ab	74.0 a	21.4	3.5 a	3.9 a	122 b	122 b
Transplanting	355 a	53.3 b	22.1	3.2 a	3.7 a	103 a	133 a

DS= dry seeded. Figures in a column followed by common letter (s) do not differ significantly at 5% level of significance by DMRT.

The grain yield was significantly different among the treatments (Table 1). The highest grain yield was obtained from dry seeding at 7-9 seeds per drop (3.9 t/ha), which was similar to transplanting (3.2 t/ha). The grain yield obtained from dry seeding at 3-6 seeds per drop was the lowest (2.7 t/ha). The higher yields of former two treatments were mainly due to the combined effect of higher number of panicles/m^2 and more number of filled grains/panicle. Similar grain yield in dry seeded and transplanted rice was also reported by Hobbs *et al*. (2002). The

straw yields obtained from different treatments followed the similar trend as that of grain yield.

The transplanted rice occupied the main field for lesser period (103 days) than dry seeded rice (122 days). On the other hand, the seed to seed growth duration was higher in transplanting method (133 days) than the dry seeded rice (Table 1). Early maturity of dry seeded rice supported the findings of Subbaiah *et al.* (2002) and Balasubramanian and Hill (2002). The dry seeded rice had the opportunity to harvest 11 days earlier than transplanted rice which might reduce the application of supplemental irrigation in late planted Aman rice.

Total variable cost was recorded higher in transplanted rice (Tk. 37950/ha) compared to direct seeded rice under both the treatments (Tk. 31900/ha in 3-6 seeds per drop and Tk. 32650/ha in 7-9 seeds per drop) due to involvement of higher land preparation cost. Between the direct seeded rice treatments, the total variable cost was higher in 7-9 seeds per drop, because of higher seed requirement in the treatment. Total gross margin (Tk. 41250) was recorded higher in direct seeded rice at 7-9 seeds per drop compared to dry seeded rice at 3-6 seeds per drop (Tk. 14800) and transplanting method (Tk. 29750).

The results indicate that the productivity of dry-seeded Aman rice (7-9 seeds per drop) with VMP is feasible and could be harvested 11 days earlier than transplanted rice.

References

Balasubramanian, V. and J. E. Hill. 2002. Direct seeding of rice in Asia: Emerging issues and strategic research needs for the 21st century. *In*: Pandey S., M. Mortimer, L. Wade, T.P. Tuong, L. Lopez, B. Hardy (eds.). Direct Seeding: Research Strategies and Opportunities. *Intl. Rice Res. Inst*. Pp. 15-39.

Hobbs, P.R., Y. Singh, G.S. Giri, J.G. Lauren, and J.M. Duxbury. 2002. Direct seeding and reduced tillage options in the rice-wheat systems of the Indo-Gangetic plains of South Asia, Pp. 201-215**.** *In:* Pandey, S., M. Mortimer, I. Wade, T.P. Tuong, K. Lopez and B. Hardy (eds). Direct seeding: research issues and opportunities. Proc. of the International Workshop on Direct Seeding in Asian Rice Systems: Strategic Research Issues and Opportunities, Bangkok, Thailand, Intl. Rice Res. Inst., Los Banos, Philippines.

Manjunatha, M. V., B. G. Masthana Reddy and V. R. Joshi. 2009. Performance of rice (*Oryza sativa*) under different methods of establishment in Tungabhadra canal command, Karnataka. *Karnataka J. Agric. Sci.* **22**(5): 1151-1152.

Subbaiah, S. V., K. Krishnaiahand V. Balasubramanian. 2002. Evaluation of drum seeder in puddle rice. *Agril. Mech. Asia, Africa, Latin America* **33**: 23-26.